



Billing Code: 4310-55

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[FWS-R8-FHC-2012-N194]

[FRES48010810420-L5-FY12]

Marine Mammals; Incidental Take during Specified Activities; Proposed Incidental Harassment Authorization

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of receipt of application; request for comments.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), have received an application from Pacific Gas and Electric Company (PG&E) for authorization under the Marine Mammal Protection Act of 1972 (MMPA) to take small numbers of southern sea otters (*Enhydra lutris nereis*) by harassment, as those terms are defined in the statute and the Service implementing regulations, incidental to a marine geophysical survey. In accordance with provisions of the MMPA, we request comments on our proposed authorization for the applicant to incidentally

take, by harassment, small numbers of southern sea otters for a period of 2.5 months beginning on October 15, 2012, and ending December 31, 2012. We anticipate no take by injury or death and include none in this proposed authorization, which would be for “take by harassment” only.

DATES: Comments and information must be received by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments by any one of the following methods:

1. *By U.S. mail or hand-delivery to:* Diane Noda, Field Supervisor, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003.
2. *By fax to:* 805–644–3958, attention to Diane Noda, Field Supervisor.
3. *By electronic mail (e-mail) to:* R8_SSO-IHA_Comment@FWS.gov.

Please include your name and return address in your message.

FOR FURTHER INFORMATION CONTACT: To request copies of the application, the list of references used in this notice, and other supporting materials, contact Lilian Carswell at the address in **ADDRESSES**, or by e-mail at Lilian_Carswell@fws.gov.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA, as amended (16 U.S.C. 1371 (a)(5)(A) and (D)), authorize the Secretary of the Interior to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a

specified activity (other than commercial fishing) within a specified geographical region, provided that we make certain findings and either issue regulations or, if the taking is limited to harassment, provide a notice of a proposed authorization to the public for review and comment.

We may grant authorization to incidentally take marine mammals if we find that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. As part of the authorization process, we prescribe permissible methods of taking and other means of affecting the least practicable impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings.

The term “take,” as defined by the MMPA, means to harass, hunt, capture, or kill, or to attempt to harass, hunt, capture, or kill, any marine mammal. “Harassment,” as defined by the MMPA, means “any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [the MMPA calls this Level A harassment], or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [the MMPA calls this Level B harassment].”

The terms “small numbers,” “negligible impact,” and “unmitigable adverse impact” are defined in 50 CFR 18.27, the Service’s regulations governing take of small numbers of marine mammals incidental to specified activities. “Small numbers” is defined as “a portion of a marine mammal species or stock whose taking would have a negligible impact on that species or stock.” “Negligible impact” is defined as “an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” “Unmitigable adverse impact” is

defined as “an impact resulting from the specified activity (1) that is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (i) causing the marine mammals to abandon or avoid hunting areas, (ii) directly displacing subsistence users, or (iii) placing physical barriers between the marine mammals and the subsistence hunters; and (2) that cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.” The subsistence provision does not apply to the southern sea otters.

Section 101(a)(5)(D) of the MMPA established an expedited process by which U.S. citizens can apply for an authorization to incidentally take small numbers of marine mammals where the take will be limited to harassment. Section 101(a)(5)(D)(iii) establishes a 45-day time limit for Service review of an application, followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, we must either issue or deny issuance of the authorization. We refer to these authorizations as Incidental Harassment Authorizations (IHAs).

Summary of Request

On August 31, 2012, we received a revised request from PG&E (applicant) for MMPA authorization to “take by harassment” southern sea otters (*Enhydra lutris nereis*) incidental to a High Energy Seismic Survey (HESS) in the vicinity of the Diablo Canyon Power Plant (DCPP) and known offshore fault zones near DCPP in San Luis Obispo County, California. An initial request was received June 28, 2012. The project is a collaborative effort between PG&E and the Lamont-Doherty Earth Observatory (LDEO), a part of Columbia University. The project would consist of deploying a seismic sound source offshore and receivers at both onshore and offshore

locations to generate data that could be used to improve imaging of major geologic structures and fault zones in the vicinity of the DCP. Project activities are necessary to comply with the requirements established by California State Assembly Bill 1632 and directives of the California Public Utilities Commission to determine whether there is any relationship between the known faults and to enhance knowledge of offshore faults that are located in proximity to the Central California Coast and DCP. Estimating the limits of future earthquake ruptures is particularly important in light of the close proximity of the Hosgri Fault Zone to DCP, one of California's major nuclear power plants.

The applicant would conduct the geophysical survey with a seismic research vessel (R/V *Marcus G. Langseth*), owned by the National Science Foundation (NSF), and support/monitoring vessels, within two partially overlapping survey box areas located between Estero Bay and the Santa Maria River mouth (survey box area 3 was initially proposed but has been removed from the project, and survey box area 1 was initially proposed for 2012 but is now proposed to be conducted in 2013; because IHAs are valid for no more than 1 year, only survey box areas 2 and 4 are considered under this authorization). Should the applicant request incidental harassment authorization for survey box area 1 in 2013, the Service will reanalyze the small number and negligible impact determinations, which would include evaluation of the information gained through the monitoring and reporting requirements proposed in this IHA, and make a new finding at that time. The survey boxes would consist of multiple parallel transect lines spaced approximately 200 meters (m) (656 feet (ft)) apart for survey box area 2 and approximately 300 m (984 ft) apart for survey box 4. The average line lengths and transit times for survey box areas 2 and 4 are given in Table 1.

Table 1. Geophysical Survey Box Line Lengths and Durations				
Survey	Average line length	Line transit time	Average line	Total time for one

Box		(hours)	change time (hours)	survey circuit (hours)
2	49.09 km (30.5 mi)	5.89	1.58	14.94
4	11.57 km (7.19 mi)	1.39	2	6.78

The geophysical survey vessel would tow a series of sound-generating air guns and sound-recording hydrophones along pre-determined shore-parallel and shore-perpendicular transects to conduct deep seismic reflection profiling of major geologic structures and fault zones in the vicinity of DCP. The air gun array would be towed at a depth of 9 m (30 ft) and consist of 18 air guns with a total air discharge volume of approximately 3,300 inch (in)³. The sound would be generated by the discharge of the air guns once every 15-20 seconds, approximately every 37.5 m (123 ft), assuming a vessel speed of 8.3 kilometers (km)/hour (hr) (4.5 knots).

The nearshore actions would include the placement of 12 seafloor geophones (*e.g.*, Fairfield Z700 nodal units) in nearshore water areas (to approximately the 70 m [300 ft] isobath). The proposed deep (10 to 15 km or 6 to 9 miles [mi]) below ground survey High Energy Seismic Survey (HESS) (energy > 2 kilo joule) would complement previously completed shallow (< 1 km [<0.6 mi] below ground surface) low energy (<2 kilo joule) 3D seismic reflection surveys.

A detailed description of the proposed action is contained in the Draft Environmental Assessment (Draft EA) for Marine Geophysical Surveys by the R/V *Marcus G. Langseth* for the Central Coastal California Seismic Imaging (Padre Associates, Inc. 2012), and the revised Incidental Harassment Authorization (IHA) Application (Padre Associates, Inc. 2012) submitted to the National Marine Fisheries Service (NMFS) and the Service on August 31, 2012.

Description of the Activity

Marine Geophysical Surveys by the R/V *Marcus G. Langseth* for the Central Coastal California

Seismic Imaging Project (project), *San Luis Obispo County, California*.

a. Timing of Activities.

The surveys are proposed to be conducted from October 15 through December 31, 2012, to avoid the period of highest marine mammal and fish migration activity and to accommodate nesting bird constraints. Mobilization could begin as early as October 15, but sound source verification procedures and active air gun surveys would start no earlier than November 1. The surveys would occur 24 hours per day, 7 days per week. The project duration would be approximately 49 days, with the seismic survey comprising approximately 23 of those days, and the remaining days occupied in project preparation, transit, and anticipated weather and/or ship maintenance delays.

The proposed survey includes a total survey line length of 3,565.8 km (2,215.7 mi), of which 46.4 km (28.8 mi) of survey transect lines would be traveled in areas shallower than the 40-m (131-ft) contour. The 40-m (131-ft) contour is the depth within which more than 95 percent of southern sea otter dives occur (Tinker *et al.* 2006a). The survey vessel would spend approximately 5.5 hours of the 23-day project (survey portion) schedule in areas shallower than the 40-m (131-ft) contour. However, because sound travels outward from the air guns, areas within the 40-m (131-ft) contour would at times be ensonified to levels of 160 decibels relative to one microPascal (dB re 1 μ Pa) or greater even when the vessel is outside this contour. Portions of these areas would be ensonified to levels of 160 dB re 1 μ Pa or greater whenever the vessel was within 6.2 km (3.9 mi) of the 40-m (131-ft) contour, totaling approximately 184 hours (115 and 69 hours for survey box areas 2 and 4, respectively) over the duration of the survey. A circular area surrounding the airguns with a radius of 1.0 km (0.63 mi) would be ensonified to levels of 180 dB re 1 μ Pa or greater. This area would be designated an “exclusion zone” (see

Mitigation Measures below).

b. Geographic Location of Activities.

The 3D seismic survey track lines encompass an area of approximately 740.5 km² (285.9 mi²), including all survey box overlapping areas (the actual survey footprint is approximately 631 km² [244 mi²]). The offshore (vessel) survey would be conducted between Cambria and the Santa Maria River mouth in both Federal and State waters, in water depths ranging from 0 to over 400 m (1,300 ft). The Point Buchon Marine Protected Area (MPA) lies within portions of the survey area, and the Cambria and White Rock Marine Conservation Areas (MCA) are located within areas of survey vessel turns. The Monterey Bay National Marine Sanctuary (MBNMS), a federally protected marine sanctuary that extends northward from Cambria to Marin County, is located to the north of the project area.

Description of Habitat and Marine Mammals Affected by the Activity

The project would be conducted in rocky-bottom and sandy-bottom marine habitat off the coast of central California in water depths ranging from 0-400 m (1,300 ft). Sea otter habitat is typically defined by the 40-m (131-ft) isobath (Laidre *et al.* 2001). Individually, survey box areas 2 and 4 would encompass 8.3 and 7.4 percent of the southern sea otter range, respectively, to levels of 160 dB re 1 µPa or greater. Because these survey box areas overlap, the total proportion of the range affected is less than the sum of two survey box areas viewed independently. In total, approximately 11.5 percent of the habitat within which the mainland population of the southern sea otter currently occurs would be encompassed to levels of 160 dB re 1 µPa or greater over the duration of the survey. This habitat is located in the southern half of the southern sea otter's range.

The southern sea otter is the only marine mammal under the jurisdiction of the Service that would be affected by the proposed project. Among the largest members of the family Mustelidae but the smallest of marine mammals, southern sea otters exhibit limited sexual dimorphism (males are larger than females) and can attain weights and lengths up to 40 kg (88 lbs) and 140 cm (55 in), respectively. They have a typical life span of 11-15 years (Riedman and Estes 1990). Unlike most other marine mammals, sea otters have little subcutaneous fat. They depend on their clean, dense, water-resistant fur for insulation against the cold and maintain a high level of internal heat production to compensate for their lack of blubber. Consequently, their energetic requirements are high, and they consume an amount of food equivalent to approximately 23 to 33 percent of their body weight per day (Riedman and Estes 1990). Contamination of the fur by oily substances can destroy its insulating properties and lead to hypothermia and death. The loss of the insulating properties of the fur exacerbates the adverse effects of oil spills on southern sea otters and is one of the reasons that increased tanker traffic and the potential for oil spills was considered in the listing of the species.

Southern sea otters forage in both rocky and soft-sediment communities in water depths generally 25 m (82 ft) or less, although individuals occasionally move into deeper water. Individual animals tend to specialize on a subset of the overall population diet. Dive depth and dive pattern vary by sex (males tend to make deep dives more frequently than females), geographic location, and diet specialization (Tinker *et al.* 2006a, Tinker *et al.* 2007). Sea otters occasionally make dives of up to 328 ft (100 m), but the vast majority of feeding dives (more than 95 percent) occur in waters less than 131 ft (40 m) in depth (Tinker *et al.* 2006a). Therefore, sea otter habitat is typically defined by the 40-m (131-ft) isobath (Laidre *et al.* 2001).

The annual patterns that characterize the movements of southern sea otters along the coast are complicated and vary between males and females. Their home ranges tend to consist of several heavily used areas with travel corridors between them. Animals often remain in an area for a long period of time and then suddenly move long distances. These movements can occur at any time of the year (Riedman and Estes 1990). Sub-adult males have the largest home ranges, followed by adult males, sub-adult females, and adult females (Tinker *et al.* 2006a). Compared to males, most females are more sedentary, although females also occasionally travel long distances. Juvenile males move further from natal groups than do juvenile females. Aggressive behavior exhibited towards the juvenile males by breeding males may be partially responsible for their more extensive travels (Ralls *et al.* 1996). Jameson (1998) noted that adult male sea otters are territorial and exclude juvenile and subordinate males from their territories. However, females move freely across these territories. Generally, southern sea otters occupy territories on a seasonal basis. Many males migrate to the range peripheries during the winter and early spring, apparently to take advantage of more abundant prey resources, but then return to the range center during the period when most breeding occurs (June to November) in search of estrous females (Jameson 1989; Tinker *et al.* 2006a; Tinker *et al.* 2006b). A peak period of pupping occurs from January to March, and a secondary pupping season occurs in late summer and early fall (Riedman *et al.* 1994). Parental care is provided solely by the female.

Status and Distribution of Affected Species

Southern sea otters are listed as threatened under the Endangered Species Act of 1973, as amended (ESA), and because of their threatened status are automatically considered “depleted” under the MMPA. A final revised recovery plan for the southern sea otter was published in 2003

(68 FR 16305). The State of California also recognizes the southern sea otter as a fully protected mammal (Fish and Game Code section 4700) and as a protected marine mammal (Fish and Game Code section 4500).

All members of the southern sea otter population are descendants of a small group that survived the fur trade near Big Sur, California. Historically ranging from at least as far north as Oregon (Valentine *et al.* 2008) to Punta Abreojos, Baja California, Mexico, in the south, southern sea otters currently occur in only two areas of California. The mainland population ranges from San Mateo County in the north to Santa Barbara County in the south and numbers approximately 2,800 animals (the 3-year running average based on the spring 2012 census is 2,792) (<http://www.werc.usgs.gov/Project.aspx?ProjectID=91>). A small translocated population occurs at San Nicolas Island, numbering approximately 50 independent animals as of 2012 (USGS unpublished data). Data from recent years suggest that southern sea otter population numbers overall are stable or slightly declining.

Southern sea otter abundance varies considerably across the range, with the highest densities occurring in the center part of the range (Monterey peninsula to Estero Bay), where they have been present for the longest. Densities tend to be most stable from year to year in rocky, kelp-dominated areas that are primarily occupied by females, dependent pups, and territorial males. In contrast, sandy and soft-bottom habitats (in particular Monterey Bay, Estero Bay, and Pismo Beach to Pt. Sal) tend to be occupied by males and sub-adult animals of both sexes (but rarely by adult females and pups) and are more variable in abundance from year to year. This variation is apparently driven in part by the long-distance movements and seasonal redistribution of males (Tinker *et al.* 2006b). The variability of counts at the south end of the

range is also related to the seasonal movements of males migrating to the range peripheries during the winter and early spring (Tinker *et al.* 2006a, Tinker *et al.* 2006b).

Standardized range-wide counts of southern sea otters were initiated in 1982. Census and distribution data are available from the U.S. Geological Survey Western Ecological Research Center at

<http://www.werc.usgs.gov/ProjectSubWebPage.aspx?SubWebPageID=4&ProjectID=91>. These data include various density estimates delineated by polygons along the central California coast from shore to the 30-m (98-ft) depth contour and between the 30-m (98-ft) and 60-m (197-ft) depth contours. Based on these density estimates, Padre Associates calculated average sea otter densities for survey box areas 2 and 4 and the associated 160 dB re 1 μ Pa exposure areas that comprise the project footprint: 1.07 and 1.7 sea otters/km² (2.77 and 4.4 sea otters/mi²), respectively.

Potential Impacts of the Proposed Seismic Survey on Sea Otters

Disturbance Reactions

Little is known regarding the effects of sound on sea otters. Sea otters have not been reported as being particularly sensitive to sound disturbance, especially in comparison to other marine mammals. For instance, Riedman (1983, 1984) observed the behavior of sea otters along the California coast during single, 100-in³ air gun pulses and pulses from a 4,089-in³ air gun array. The air gun array produced low-frequency (5-500-Hertz [Hz]) sounds at 230 dB re 1 μ Pa at 1 m. No disturbance reactions were evident when the air gun array was as close as 0.9 km (0.5 mi), and the sea otters did not respond noticeably to the single air gun. The proposed seismic

survey air gun array has an air discharge volume of approximately 3,300 in³, a dominant frequency of 0-188 Hz, and a source output (downward) of 252 dB re 1 µPa at 1 m.

Underwater sounds are not likely to affect sea otters at the surface, due to the pressure release effect. Thus, the susceptibility of sea otters to disturbance from underwater sounds is probably restricted to behaviors during which the head is submerged, such as during foraging dives and underwater swimming and, intermittently, during grooming bouts. Yeates *et al.* (2007) reported the following mean percent activity categories for six adult male California sea otters: Feeding (36.3), resting (40.2), swimming (8.5), grooming (9.1), and other (7.3). In a study with a much larger sample size, Tinker *et al.* (2008) reported that central California sea otters spent approximately 40 percent of their time foraging. Because underwater behaviors constitute less than half of the total activity budget of southern sea otters along the central California coast, their exposure to underwater sounds is limited. Nevertheless, the disruption of underwater behaviors may result in the disruption of the entire activity budget of an exposed individual and, potentially, in the disturbance of associated individuals. In the case of the proposed seismic survey, which consists of multiple parallel closely spaced transect lines, with a time for one complete circuit of 14.94 hours (survey box area 2) or 6.78 hours (survey box area 4), it is virtually certain that any sea otter engaging in surface behaviors during one pass of the vessel would be engaging in underwater behaviors during a subsequent pass of the vessel. Therefore, all sea otters that remained in the area would ultimately be exposed to underwater sound associated with the seismic survey.

Observed sea otter responses to disturbance are highly variable, probably reflecting the level of noise and activity to which they have been exposed and become acclimated over time and the particular location and social or behavioral state of that individual (G. Bentall, Monterey

Bay Aquarium Sea Otter Research and Conservation Program, pers. comm.). Reactions to anthropogenic noise can be manifested as visible startle responses, flight responses (flushing into water from haulouts or “splash-down” alarm behavior in surface-resting rafts), changes in moving direction and/or speed, changes in or cessation of certain behaviors (such as grooming, socializing, or feeding), or avoidance of areas where noise sources are located.

The biological significance of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification would be expected to be biologically significant if the change affected growth, survival, or reproduction. Potentially significant behavioral modifications include:

- Disturbance of resting sea otters
- Marked disruption of foraging behaviors
- Separation of mothers from pups
- Disruption of spatial and social patterns (sexual segregation and male territoriality)

Currently, NMFS uses 160 dB re 1 μ Pa at received level for impulse noises (such as air gun pulses) as the onset of behavioral harassment (Level B harassment) for all marine mammals that are under its jurisdiction, and 180 dB re 1 μ Pa at received level as the threshold for potential injury or permanent physiological damage (Level A harassment) for cetaceans (70 FR 1871, January 11, 2005). In the absence of data on which to base thresholds specific to sea otters, we utilize the 160 dB re 1 μ Pa and 180 dB re 1 μ Pa thresholds for Level B and Level A harassment of sea otters. Based on the 160 dB re 1 μ Pa exposure area for survey box areas 2 and 4 and the average densities of sea otters in these areas, we estimate that approximately 352 sea otters will be exposed to underwater sound levels of 160 dB re 1 μ Pa or greater (Table 2). Note that because survey box areas 2 and 4 overlap, the total number of sea otters expected to be exposed

to this level of sound is less than the sum of the numbers of sea otters in the 160 dB re 1 μ Pa exposure areas for survey box areas 2 and 4. In the overlapping area, sea otters will be subject to sound exposures associated with both survey box areas. Because limited evidence suggests that sea otters are less susceptible to acoustic disturbance than other marine mammals, these thresholds may be overly conservative. If, during implementation of the project, sea otters appeared to be undisturbed by sound to the extent that the exclusion zone (see *Mitigation Measures* below) could not be successfully kept clear of sea otters, the applicant would have the option under the IHA to request that the Service approve a reduction of the exclusion zone radius. We would review the request and notify the applicant of our determination.

Table 2. Estimated number of sea otters exposed to underwater sound levels of 160 dB re 1 μ Pa or greater			
Survey Box	Portion of 160 dB exposure area (km ²) affecting sea otter population	Number of sea otters/km ²	Number of sea otters in 160 dB exposure area
2	245	1.07	261
4	155	1.70	263
2 and 4 merged	288	1.22	352

Hearing Impairment and other Physical Effects

Exposure to very strong sounds could affect southern sea otters physically in a number of ways. These include temporary threshold shift (TTS), which is short-term hearing impairment, and permanent threshold shift (PTS), which is permanent hearing loss. Non-auditory physical effects may also occur in southern sea otters exposed to strong underwater pulsed sound. Non-auditory physiological effects or injuries that may theoretically occur in mammals close to a strong sound source include stress, neurological effects, and other types of organ or tissue damage. However, there is no definitive evidence that any of these effects occur in sea otters, even those in close proximity to large arrays of air guns. It is unlikely that any effects of these

types would occur during the present project given the brief duration of exposure of any given sea otter and the planned monitoring and mitigation measures. The following subsections discuss in more detail the possibilities of TTS, PTS, and non-auditory physical effects.

Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter 1985). While an animal is experiencing TTS, the hearing threshold rises and a sound must be stronger in order to be heard. It is a temporary phenomenon, and (especially when mild) is not considered physical damage or “injury” (Southall *et al.* 2007). Rather, the onset of TTS is an indicator that, if the animal is exposed to higher levels of that sound, physical damage is ultimately a possibility.

The magnitude of TTS depends on the level and duration of noise exposure and, to some degree, on frequency, among other considerations (Kryter 1985; Richardson *et al.* 1995; Southall *et al.* 2007). For sound exposures at or somewhat above the TTS threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. In terrestrial mammals, TTS can last from minutes or hours to days. Only limited data have been obtained on sound levels and durations necessary to elicit mild TTS in marine mammals, and none of the published data concern TTS elicited by exposure to multiple pulses of sound during operational seismic surveys (Southall *et al.* 2007).

Permanent Threshold Shift (PTS)

When PTS occurs, there is physical damage to the sound receptors in the ear. In severe cases, there can be total or partial deafness. In other cases, the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter 1985). There is no specific evidence that exposure to pulses from air guns can cause PTS in any marine mammal, even with large arrays

of air guns. However, given the possibility that mammals close to an air gun array might incur at least mild TTS in the absence of appropriate mitigation measures, there has been further speculation about the possibility that some individuals in very close proximity to air guns might incur PTS (*e.g.*, Richardson *et al.* 1995; Gedamke *et al.* 2008). Single or occasional occurrences of mild TTS are not indicative of permanent auditory damage, but repeated or (in some cases) single exposures to a level well above that causing TTS might elicit PTS.

Vessel Collision Effects

Boat strikes are a relatively low but persistent source of sea otter mortality. During the 2006-2010 period, 11 sea otters were suspected to have been struck by boats (USGS and CDFG unpub. data). However, vessel strikes involving sea otters appear primarily to involve small, fast boats, and most collision reports have come from small vessels (NMFS 2003; NMFS 2006). Because sea otters spend a considerable portion of their time at the surface of the water, they are typically visually aware of approaching boats and are able to move away if the vessel is not traveling too quickly. The noise of approaching boats provides an additional warning. Because the R/V *Marcus G. Langseth* and associated scout boats would be traveling relatively slowly (4.5 knots), it is unlikely that sea otters would suffer injury or death from a vessel collision.

Potential Impacts on Habitat

The proposed seismic survey would not result in any known impacts on the habitats used by southern sea otters or the food sources they exploit. The main impact of the project would be temporarily elevated noise levels. Although approximately 11.5 percent of the mainland southern sea otter range would eventually be ensonified to sound levels of 160 dB re 1 μ Pa or

greater by the time the survey was completed, only one circular area with a radius of approximately 6.2 km (3.9 mi) would be ensonified to these levels or greater at any one time.

Preliminary biological surveys have been completed for the areas where marine geophone lines are proposed to be placed to ensure they are routed along corridors that minimize contact with rock substrates, kelp canopy areas, and seagrass beds. In areas where such habitats are unavoidable due to their contiguous distribution along the coastline, the placement and recovery of the small geophone units in potentially sensitive areas would be done by divers/remotely operated vehicles (ROVs) deployed from small vessels in such a way as to minimize any potential effects and to ensure that no sea otter habitat is permanently altered. All deployment and recovery operations would be conducted during daylight hours and monitored by an onboard Protected Species Observer (PSO).

Potential Impacts on Subsistence Needs

The subsistence provision of the MMPA does not apply to southern sea otters.

Mitigation Measures

Efforts were made during the initial project planning phase to identify the minimum energy source level needed for data collection and thereby to minimize the sound impacts to the marine environment, to reduce the area of the survey to only the area necessary for critical data collection, and to consider and plan around marine biological resources/life functions (such as presence, breeding, feeding, and migration) in the survey area.

PG&E and LDEO are proposing the following mitigation measures to reduce the potential effects of the project on southern sea otters resulting from air guns and vessel activities:

- PG&E would conduct an aerial survey approximately 1 week prior to the start of the seismic survey to obtain pre-survey information on the numbers and distribution of southern sea otters in the seismic survey area. Weekly aerial surveys would also be conducted throughout the survey program. Survey routes would be adjusted as feasible to avoid concentrations of sea otters,
- Protected Species Observers (PSOs) (NMFS-certified and Service-approved) would be stationed on the primary survey vessel and on the support and scout vessels. PSOs would also be present on vessels involved in the deployment and recovery of marine geophones,
- PSOs would visually monitor sea otters within the designated survey exclusion (180 dB re 1 μ Pa) and safety (160dB re 1 μ Pa) zones during all daylight hours,
- If one or more sea otters were observed near the exclusion zone and appeared to be about to enter it, avoidance measures would be taken, including decreasing vessel speed or implementing a power down,
- If one or more sea otters were observed within the exclusion zone, the air gun arrays would be shut down within several seconds. The PSO would then maintain a watch to determine when the sea otter(s) appeared to be outside the exclusion zone such that air gun operations could resume,
- Power-up, ramp-up, and shut-down procedures would be implemented during all air gun operations,
- A mitigation air gun (a continuously operated, low-volume, single air gun versus all eighteen) would be used during survey turns outside of the 3D survey area as well as

during power-down and standby periods to deter marine wildlife from re-entering the exclusion zone,

- During nighttime operations, whenever the vessel survey tracks were located inshore of the 40-meter depth contour (where physical encounters with sea otters are more likely), PSOs would visually monitor the area forward of the survey vessel with the aid of infra-red (night vision) goggles/binoculars and the forward-looking infra-red (FLIR) system available onboard the R/V *Marcus G. Langseth*. Mitigation measures, such as avoidance or power-downs/shut-downs, would be implemented if a sea otter were detected in the path of the survey vessel.

Findings

The Service proposes the following findings regarding this action:

Small Numbers Determination and Estimated Take by Incidental Harassment

For small take analysis, the statute and legislative history do not expressly require a specific type of numerical analysis, leaving the determination of “small” to the agency’s discretion. Factors considered in our small numbers determination include the following:

(1) *The number of southern sea otters inhabiting the proposed impact area is small relative to the size of the southern sea otter population.* The number of southern sea otters that could potentially be taken by harassment in association with the proposed activity is 352, less than 13 percent of the estimated population size of 2,792.

(2) *The area where the activity would occur is small relative to the range of the southern sea otter.* The combined footprint of survey box areas 2 and 4 is 631 km² (244 mi²) and the

portion of this combined footprint within sea otter range is 4.7 km² (1.8 mi²), whereas the southern sea otter range encompasses approximately 1,346 km² (519.7 mi²). Therefore, the survey footprint would affect less than 0.4 percent of the total range of the southern sea otter, and exposure to the 160 dB sound levels would occur in less than 12 percent of the total range of the southern sea otter. Additionally, it should be noted that only one circular area, with a radius of approximately 6.2 km (3.9 mi), would be ensonified to these levels or greater at any one time.

(3) *Monitoring requirements and mitigation measures are expected to limit the number of incidental takes.* Level A harassment (harassment that has the potential to injure southern sea otters) is not authorized. PSOs would ensure that sea otters are not exposed to sounds or activities that may result in Level A harassment. PSOs would be present during all daylight survey activities and would have the authority to order a power-down or shut-down of the seismic air guns, and/or redirect survey activities to avoid observed sea otters if sea otters appeared to enter or approach the 180 dB re 1 µPa exclusion zone. If a sea otter were observed within or approaching the 180 dB re 1 µPa exposure area of 1,010 m (0.63 mi), avoidance measures would be taken, such as decreasing the speed of the vessel and/or implementing a power-down or shut-down of the air guns. Nighttime monitoring would be conducted with the aid of night-vision binoculars and a FLIR system when the R/V *Marcus G. Langseth* was inshore of the 40-m (131-ft) depth contour. All nearshore vessel operations associated with marine geophone placements would be monitored by PSOs. Power-up and ramp-up procedures would prevent Level A harassment and limit the number of incidental takes by Level B harassment by affording time for sea otters to leave the area. Monitoring and mitigation measures are thus expected to prevent any Level A harassment and to minimize Level B harassment.

It should be noted that if sea otters appeared to be undisturbed by sound to the extent that

the exclusion zone could not be successfully kept clear of sea otters, the applicant would have the option to request that the Service approve a reduction of the exclusion zone radius. We would review the request and notify the applicant of our determination. Our approval would not constitute authorization of Level A harassment. Rather, our approval would be based on a determination, following review of information on sea otter behavior obtained through required monitoring during the survey, that a smaller exclusion zone would avoid Level A harassment.

Negligible Impact

The Service finds that any incidental “take by harassment” that may result from this proposed seismic survey cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival, and would, therefore, have no more than a negligible impact on the stock. In making this finding, we considered the best available scientific information, including (1) the biological and behavioral characteristics of the species, (2) the most recent information on distribution and abundance of sea otters within the area of the proposed activity, (3) the potential sources of short-term disturbance during the proposed activity, and (4) the potential response of southern sea otters to this short-term disturbance.

Limited evidence (Riedman 1983, 1984) suggests that sea otters are not particularly sensitive to or adversely affected by sound. Responses of sea otters to disturbance would most likely be diving and/or swimming away from the sound source, which may entail the temporary, but not sustained, interruption of foraging, breeding, resting, or other natural behaviors. Thus, although 352 sea otters (approximately 13 percent of the mainland population) are estimated to be potentially taken (*i.e.*, potentially disturbed) by Level B harassment by means of exposure to

sound levels of 160dB re 1 μ Pa or greater over the duration of the project, we do not expect that this type of harassment would result in adverse effects on the species through effects on annual rates of recruitment or survival. In order to verify this conclusion, we have recommended that an ancillary scientific study be conducted during the survey and afterwards to detect effects on individual sea otters and any potential changes in annual rates of recruitment and survival among sea otters exposed to sound. PG&E and LDEO have agreed to arrange, with input from the Service, for this study and subsequent analysis (see “Marine Mammal Monitoring” below). The preliminary results of this study will be included in our analysis should the applicant request incidental harassment authorization for survey box area 1 in 2013.

The mitigation measures outlined above are intended to minimize the number of sea otters that may be disturbed by the proposed activity. Any impacts on individuals are expected to be limited to Level B harassment and to be of short-term duration. No take by injury or death is anticipated or authorized. Should the Service determine, based on the monitoring and reporting to be conducted throughout the survey activities, that the effects are greater than anticipated, the authorization may be modified, suspended, or revoked.

Our finding of negligible impact applies to incidental take associated with the proposed activity as mitigated through this authorization process. This authorization establishes monitoring and reporting requirements to evaluate the impacts of the authorized activities, as well as mitigation measures designed to minimize interactions with, and impacts to, southern sea otters.

Impact on Subsistence

The subsistence provision of the MMPA does not apply to southern sea otters.

Marine Mammal Monitoring

The applicant would be required to conduct monitoring of southern sea otters during the seismic surveys in order to implement the mitigation measures that require real-time monitoring and to satisfy monitoring required under the MMPA. Project personnel would be required to record information regarding location and behavior of all sea otters observed during operations. When conditions permitted, information regarding age (pup, independent) and tag color and position (for flipper-tagged animals) would also be required to be recorded.

Due to the lack of data on the effects of air guns on sea otters, in addition to project-related mitigation monitoring, the Service has recommended that PG&E and LDEO use the survey as an opportunity to investigate the potential effects of air guns on sea otters. PG&E and LDEO have agreed to address this request by arranging, with input from the Service, for the design and implementation of an ancillary scientific study during and after the survey and subsequent analysis. The study would be conducted by researchers with the appropriate scientific expertise and permits (USGS, Biological Resources Division, in cooperation with the California Department of Fish and Game and other research partners). The Sea Otter Monitoring Program is described in Appendix E to the revised IHA application. To supplement data obtained by researchers from bottom-mounted passive acoustic recorders placed in and near kelp beds used by resident sea otters, PG&E and LDEO would provide researchers with GPS-referenced time data for the air gun shots from the seismic survey vessel. These data would be used to validate the acoustic modeling underlying the 160 dB re 1 μ Pa safety zone and 180 dB re 1 μ Pa exclusion zone radii, to measure the propagation of sound through sea otter habitat, and to estimate received sound levels that may be useful in determining sea otter behavioral response

thresholds as a function of sound exposure.

Monitoring and Reporting

The applicant would be required to implement the following monitoring and reporting program to increase knowledge regarding the species and to assess the level of take caused by the proposed action:

a. Pre-Activity Monitoring

Approximately 1 week prior to the start of seismic survey operations, an aerial survey would be flown to establish a baseline for numbers and distribution of southern sea otters in the project area;

b. Activity Monitoring

Vessel-based monitoring for marine wildlife, including southern sea otters, would be done by trained PSOs throughout the period of survey activities. PSO duties would include watching for and identifying marine mammals; recording their numbers, distances, and any reactions to the survey operations; and documenting potential “take by harassment” as defined by the Service and NMFS.

A sufficient number of PSOs would be required onboard the survey and support vessels to meet the following criteria:

- 100-percent monitoring during all periods of survey operations (visual everywhere during daylight and inshore of the 40-m contour at night); and
- A maximum of four consecutive hours on watch per PSO.

PSO teams would consist of Service- and NMFS-approved PSOs and experienced field biologists. An experienced crew leader would supervise the PSO team onboard the survey

vessels. Crew leaders and biologists serving as PSOs would be individuals with experience as PSOs during high-energy survey projects (HESS), and/or shallow hazards surveys in California. PSOs would be required to have previous marine mammal observation experience, and field crew leaders would be highly experienced with previous vessel-based marine mammal monitoring and mitigation projects. Resumes for those individuals would be provided to the Service and NMFS for review and acceptance of their qualifications. PSOs would be familiar with the region and the marine mammals of the area and would complete an in-house observer training course designed to familiarize individuals with monitoring and data collection procedures.

The PSOs would watch for marine mammals from the best available vantage point on the survey vessels, typically the PSO tower on the R/V *Marcus G. Langseth*, or from dedicated monitoring vessels. The PSOs would scan systematically with the unaided eye and with binoculars. Personnel on the bridge of the survey and monitoring vessels would assist the PSOs in watching for marine mammals.

Information recorded by PSOs would include:

- Species, group size, age/size/gender (if determinable), behavior when first sighted and after initial sighting, heading (if determinable), bearing and distance from observer, apparent reaction to activities (*e.g.*, none, avoidance, approach, paralleling, *etc.*), closest point of approach, and pace;
- Time, location (GPS coordinates), sea state, visibility, sun glare, and speed and activity of the vessel, and
- Positions of other vessel(s) in the vicinity of the observer location.

The ship's position, speed of the vessel, water depth, sea state, visibility, and sun glare would also be recorded at the start and end of each observation watch, every 30 minutes during a watch, and whenever there were substantial changes in any of those variables.

If a southern sea otter were seen within the exclusion zone, the geophysical crew would be notified immediately so that the mitigation measures called for in the applicable authorization(s) could be implemented. The air gun arrays would be shut down within several seconds. The PSO would then maintain a watch to determine when the sea otter(s) appeared to be outside the exclusion zone such that air gun operations could resume.

Aerial surveys would be conducted weekly during seismic survey operations to assist in the identification and avoidance of southern sea otters within the project area;

c. Post-Activity Monitoring

Approximately 1 week prior to the completion of the offshore seismic survey operations, a final aerial survey would be conducted to document the number and distribution of southern sea otters in the project area. These data would be used in comparison with original survey data collected prior to the seismic operations.

No post-activity monitoring is proposed.

d. Reporting

Throughout the survey program, PSOs would prepare a report each week summarizing the recent results of the monitoring program. The reports would summarize the numbers of sea otters sighted. These reports would be provided to the Service, PG&E, LDEO, and NSF.

The results of the vessel-based monitoring, including estimates of potential "take by harassment," would be compiled in a report and submitted to the Service within 90 days of survey conclusion; the report would also be posted on the NSF website at:

<http://www.nsf.gov/geo/oce/envcomp/index.jsp>. Reporting would address any requirements established by the Service and NMFS.

Along with any other State or Federal requirements, the 90-day report would minimally include:

- Summaries of monitoring effort: Total hours, total distances, and distribution of marine mammals through the study period accounting for sea state and other factors affecting visibility and detectability of marine mammals;
- Analyses of the effects of various factors influencing the detectability of marine mammals, including sea state, number of observers, and fog/glare;
- Species composition and occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender, and group sizes, and analyses of the effects of survey operations;
- Sighting rates of marine mammals during periods with and without air gun activities (and other variables that could affect detectability);
- Initial sighting distances versus air gun activity state (firing, powered down, or shut-down);
- Closest point of approach versus air gun activity state;
- Observed behaviors and types of movements versus air gun activity state;
- Numbers of sightings/individuals seen versus air gun activity state;
- Distribution around the survey vessel versus air gun activity state; and
- Estimates of “take by harassment”.

Endangered Species Act

The southern sea otter is currently listed as threatened under the Endangered Species Act of 1973, as amended (ESA). Because the proposed activities may affect the southern sea otter, pursuant to section 7(a)(2) of the ESA, the Service must ensure that its issuance of the IHA will not jeopardize the species. In addition, the NSF must ensure that its provision of the R/V *Marcus G. Langseth* will likewise not jeopardize the southern sea otter. To address the obligations of both the Service and NSF pursuant to section 7(a)(2) of the ESA, the Service has initiated internal formal consultation on issuance of an IHA, and the NSF has initiated formal consultation with the Service for its action of providing the R/V *Marcus G. Langseth* for the survey. These consultations will be addressed in a single biological opinion. The biological opinion will consider the effects of the project on the southern sea otter, including our issuance of an IHA. The biological opinion will be issued prior to the decision on the IHA.

National Environmental Policy Act (NEPA)

The seismic survey is described in the Draft EA prepared by the applicant under the supervision of the NSF, the lead Federal agency. If we find it to be adequate and appropriate, we will adopt the Draft EA as the Service's Environmental Assessment (EA) of whether issuance of the IHA would have a significant effect on the human environment. Our analysis will be completed prior to issuance or denial of the IHA and will be available at <http://www.fws.gov/ventura/speciesinfo/>. To obtain a copy of the Draft EA, contact the individual identified in the **FOR FURTHER INFORMATION CONTACT** section.

Government-to-Government Relations with Native American Tribal Governments

In accordance with the President's memorandum of April 29, 1994, "Government-to-

Government Relations with Native American Tribal Governments’’ (59 FR 22951), Executive Order 13175, Secretarial Order 3225, and the Department of the Interior’s manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with Federally recognized Tribes on a Government-to-Government basis. We have evaluated possible effects on federally recognized Indian Tribes and have determined that there are no effects.

Proposed Authorization

The Service proposes to issue an IHA for southern sea otters harassed incidentally by the applicant in the course of conducting seismic surveys beginning October 15, 2012, and ending December 31, 2012. Mobilization could begin as early as October 15, but sound source verification procedures and active air gun surveys would start no earlier than November 1. Authorization for incidental take beyond this time period would require a new request. The final IHA, if issued, will incorporate the mitigation, monitoring, and reporting requirements discussed in this proposal. The applicant would be responsible for following those requirements. If the level of activity exceeded that described by the applicant, or the level or nature of take exceeded those projected here, the Service would reevaluate its findings. Conversely, if sea otters appeared to be undisturbed by sound to the extent that the exclusion zone could not be successfully kept clear of sea otters, the applicant would have the option to request that the Service approve a reduction of the exclusion zone radius. We would review the request and notify the applicant of our determination. The Secretary would have the ability to modify, suspend, or revoke this authorization if the findings were not accurate or the conditions described in this notice were not being met. Should the applicant request incidental harassment authorization for survey box area 1 in 2013, the Service will re-analyze the small numbers and negligible impact determinations,

which would include an evaluation of the information gained through the monitoring and reporting requirements proposed in this IHA, and make a new finding at that time.

Request for Public Comments

The Service requests interested parties to submit comments and information concerning this proposed IHA. Consistent with section 101(a)(5)(D)(iii) of the MMPA, we are opening the comment period on this proposed authorization for 30 days (*see DATES*).

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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Alexandra Pitts

Deputy Regional Director, Pacific Southwest Region.

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